

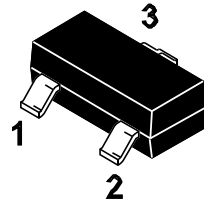
Features

- Low dynamic output impedance.
- Sink current capability of 1.0 to 100mA.
- Low output noise voltage
- Fast turn on response

Application

- It provides very wide applications, including shunt regulator, series regulator, switching regulator, voltage reference and others.

SOT-23

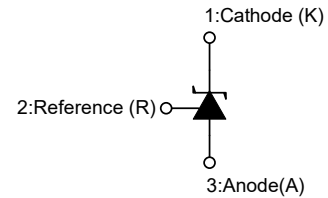


1. Cathode 2.Reference 3.Anode

Marking Code:

TL431: 431

TL431A: 431A



Absolute Maximum Ratings (Ta=25°C unless otherwise specified)

Parameter	Symbol	Value	Units
Cathode Voltage	V_{KA}	37	V
Cathode Current Range(Continuous)	I_{KA}	-100 ~ +150	mA
Reference Input Current Range	I_{REF}	-0.05 ~ +10	mA
Maximum Power Dissipation	P_D	350	mW
Operating Junction Temperature	T_J	150	°C
Storage Temperature Range	T_{STG}	-65 ~ +150	°C

Recommended Operating Conditions

Parameter	Symbol	Min.	Max.	Units
Cathode Voltage	V_{KA}	V_{REF}	36	V
Cathode Current	I_{KA}	1	100	mA
Operating Ambient Temperature Range	T_{OPR}	-25	85	°C

Electrical Characteristics (Ta=25°C unless otherwise specified)

Parameter	Symbol	Test Conditions	Min.	Typ.	Max.	Unit	
Reference Input Voltage Fig1	V_{REF}	$V_{KA}=V_{REF}, I_{KA}=10mA$	TL431	2.44	2.495	2.55	V
			TL431A	2.48	2.495	2.51	V
Deviation of Reference Input Voltage Over Temperature Fig1	ΔV_{REF}	$V_{KA}=V_{REF}, I_{KA}=10mA$ $-25^{\circ}C \leq T_A \leq +85^{\circ}C$	--	4.5	17	mV	
Ratio of Change in Reference Input Voltage to The Change in Cathode Voltage Fig2	$\frac{\Delta V_{REF}}{\Delta V_{KA}}$	$I_{KA}=10mA$	$\Delta V_{KA}=10V \sim V_{REF}$	--	-1.0	-2.7	mV/V
			$\Delta V_{KA}=36V \sim 10V$	--	-0.5	-2.0	
Reference Input Current Fig2	I_{REF}	$I_{KA}=10mA, R1=10K\Omega, R2=\infty$	--	1.5	4	μA	
Deviation of Reference Input Current Over Full Temperature Range Fig2	ΔI_{REF}	$I_{KA}=10mA, R1=10K\Omega, R2=\infty, -25^{\circ}C \leq T_A \leq +85^{\circ}C$	--	0.4	1.2	μA	
Minimum Cathode Current for Regulation Fig1	$I_{KA(MIN)}$	$V_{KA}=V_{REF}$	--	0.45	1	mA	
Off-State Cathode Current Fig3	$I_{KA(OFF)}$	$V_{KA}=36V, V_{REF}=0$	--	0.05	1.0	μA	
Dynamic Impedance	Z_{KA}	$V_{KA}=V_{REF}, I_{KA}=1 \sim 100mA,$ $f \leq 1.0KHZ$	--	0.15	0.5	Ω	

Figure 1. Test Circuit for $V_{KA} = V_{REF}$

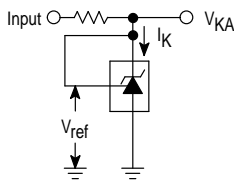


Figure 2. Test Circuit for $V_{KA} > V_{REF}$

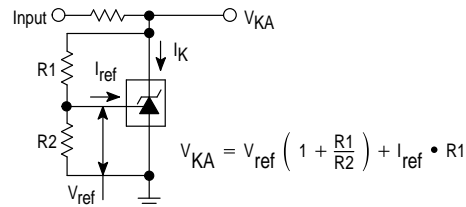
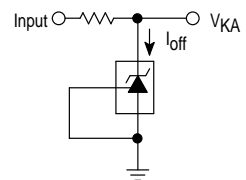
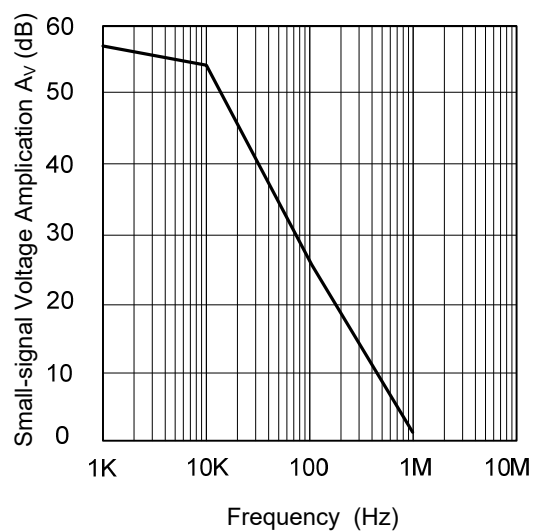
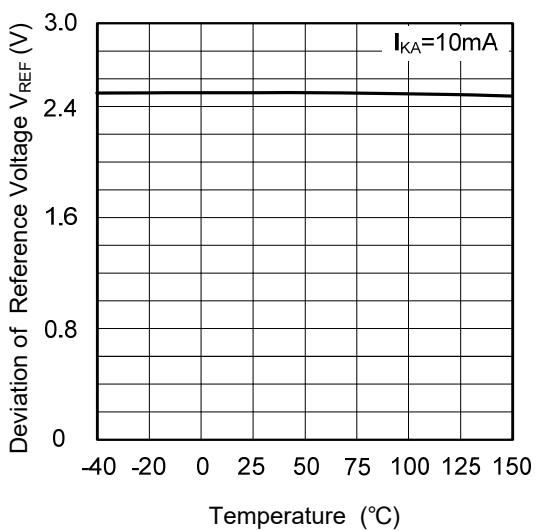
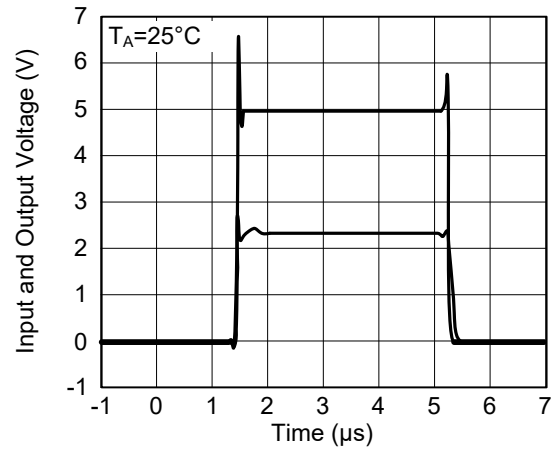
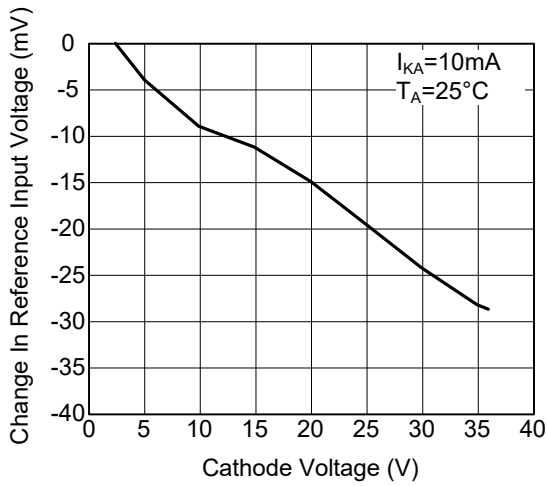
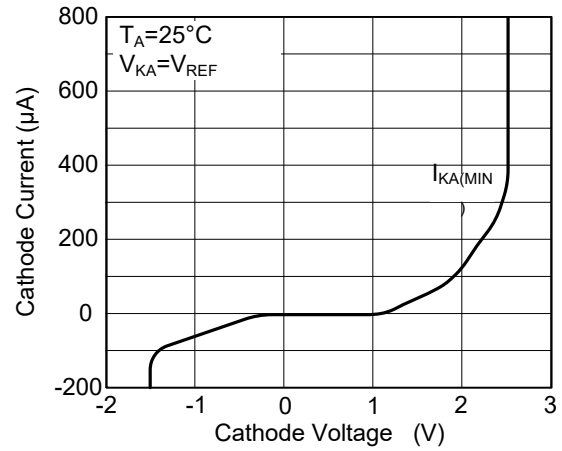
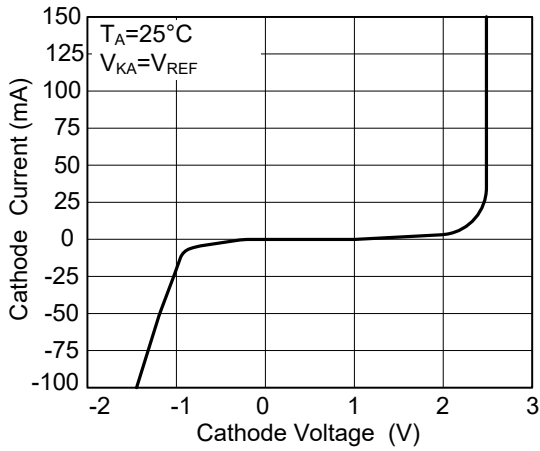


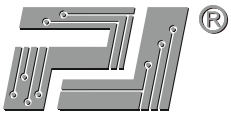
Figure 3. Test Circuit for I_{OFF}





Typical Characteristic Curves

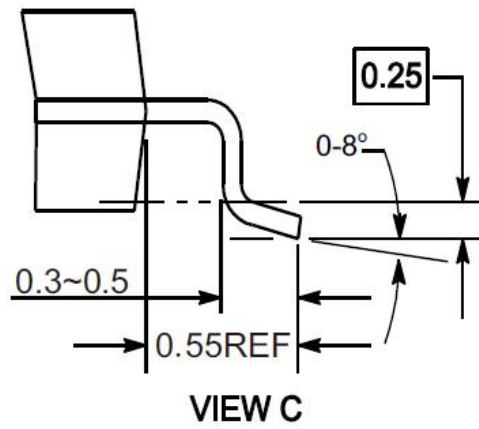
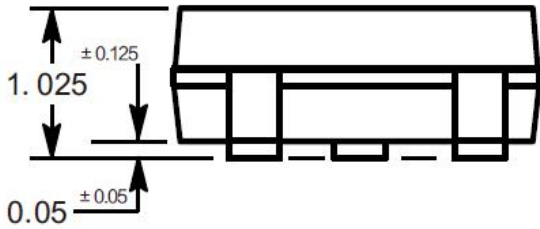
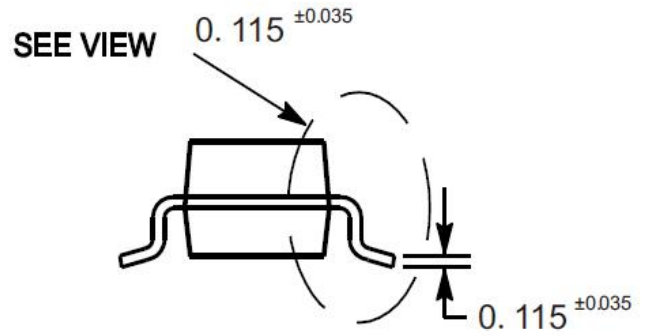
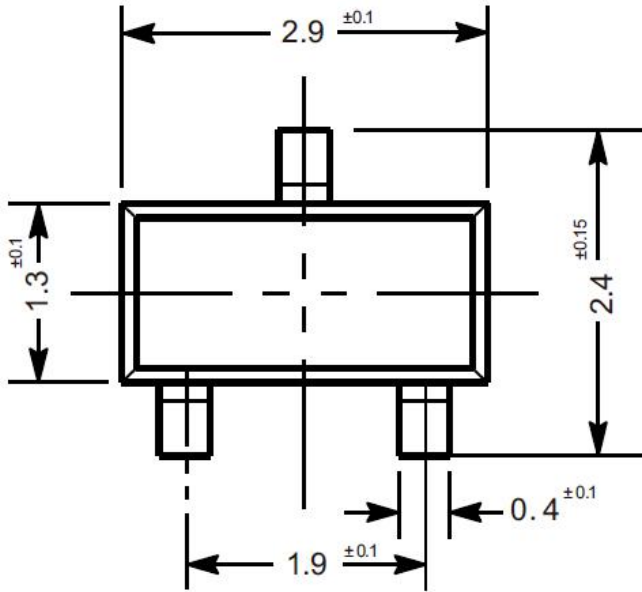




Package Outline

SOT-23

Dimensions in mm



Ordering Information

Device	Package	Shipping
TL431-KRA, TL431A-KRA	SOT-23	3,000PCS/Reel&7inches